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REVISION OF *METHARPINIA* AND *MICROPHOXUS* (MARINE PHOXOCEPHALID AMPHIPODA FROM THE AMERICAS)

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Abstract.—Several species of marine phoxocephalid formerly placed in *Paraphoxus* are removed to *Metharpinia* and *Microphoxus*. Because these species retain apical spination on the rami of uropods 1–2 they appear to be the most plesiomorphic of the *birubiin* group of the family in the Americas; this conclusion is based on the evolutionary scheme proposed by Barnard and Drummond (1978) in their Australian study. The species treated herein are: *Microphoxus minimus, M. cornutus, Metharpinia longirostris, M. jonesi, M. floridana,* and 2 new species, *M. oripacifica* and *M. coronadoi*. Each taxon is redescribed in the new expanded format of the family.

Metharpinia Schellenberg (1931) and *Microphoxus* J. L. Barnard (1960) appear to be the most primitive taxa of the birubiin-parharpiin group of Phoxocephalidae in the Americas. The realignment of phoxocephalids carried out by Barnard and Drummond (1978) for the Australian fauna forces reassessment of the American taxa, a course announced as in progress by Barnard and Drummond (1976). All previously described American taxa have now been reexamined and several new genera established by Barnard (1979). This paper is the first of several in which the species of American phoxocephalid genera will be redescribed under the new format proposed by Barnard and Drummond (1976, 1978).

Although each American genus of this subfamily group is distinct from genera in Australia, in most cases the distinction is small, often confined to one slim character. The relationship to certain Australian taxa is therefore deemed to be very close and to have its roots in a pool of common ancestors focused in Gondwanaland seas. In 1960 Barnard could not distinguish genera in this group; today, through expansion of character states a barely minimum distinction can be made and an evolutionary mode described. If Barnard and Drummond are correct that the geographic pattern of taxa in the Phoxocephalidae suggests an origin in Gondwana seas and that subsequent control of distribution in the group is tectonic, then one must conclude that evolution in the group outside of Australia has been very slow and not very successful. The birubiin-parharpiniin group has not diversified greatly in the North Pacific Ocean and has scarcely penetrated the North Atlantic Ocean. In Australia numerous species occur in the group but most character linkages remain extant in the evolutionary web so that little generic diversification has occurred. In other words, intermediate species have not become extinct.

Unlike most American species of phoxocephalids in the birubiin group, *Metharpinia* and *Microphoxus* retain subapical spination on the rami of uropods 1–2. This is considered to be a primitive character derived from ancestors that may have resembled *Pontharpinia pinguis,* and Australian species with many supposed plesiomorphic characters. Subapical spines in *Metharpinia* and *Microphoxus* are poorly developed and presumed to be in a long evolutionary downfall. This conclusion is based on the premise that the most diverse and widespread phoxocephalid genera are those lacking apical ramal spines. This includes taxa radiating outwards from the antiboreal phoxocephalid center into the north Pacific Ocean and into the deep seas. The evolutionary trend in phoxocephalids appears to be a simplification of armaments, reduction in size or protrusion of appendages, reduction in articulation capability of uropods and posterior body segments, reduction in size of rostrum and the increase in adaptations with commensal properties.

The following abbreviations are used in the figures included in this paper: **A,** antenna; **B,** pleon; **D,** peduncle; **E,** epimeron; **F,** accessory flagellum; **G,** gnathopod; **H,** head; **I,** coxa; **J,** molar; **L,** labrum; **M,** mandible; **N,** ramus; **O,** palmar corner of gnathopod; **P,** pereopod; **R,** uropod; **S,** maxilliped; **T,** telson; **U,** upper lip; **W,** right lacinia mobilis; **X,** maxilla; **Y,** apicomedial corner on peduncle of uropod 3; **b,** apicomedial; **d,** dorsal; **e,** broken; **f,** flattened; **h,** reconstructed; **i,** inner; **l,** left; **m,** molar; **o,** outer; **p,** medial; **r,** right; **s,** setae removed.

Lower case letters to right of capitals refer to items above; lower case letters to left of capitals refer to specimens cited in text.

Microphoxus J. L. Barnard

Microphoxus J. L. Barnard, 1960:291 (*Microphoxus minimus* J. L. Barnard, 1960, original designation).—Barnard and Drummond, 1978:414.

Diagnosis.—Eyes present. Flagella of antennae 1–2 unreduced in female, article 2 of antenna 1 ordinary, ventral setae widely spread; article 1 of antenna 2 not ensiform, article 3 with 2 setules, facial spines on article 4 in one main row (type) or 2+ rows; article 5 ordinary in size.

Right mandibular incisor with 3 teeth, molar not triturative, small, pillow-shaped, bearing 3 (type) or more splayed spines, not bearing fuzz, palpar hump small. Palp of maxilla 1 biarticulate, inner plate with one (type) or 4 setae; setation of maxilla 2 ordinary; inner plate of maxillipeds ordinary, apex of palp not protuberant, dactyl elongate, apical nail distinct, medium to elongate.

Gnathopods ordinary, small, similar, article 5 free, elongate, with weak eusirid attachment, palms oblique to almost transverse, hand ovatorectangular, heavily setose anteriorly but not trichophoxoid in shape. Article 3 on pereopod 5 of broad form, articles 4–5 of pereopods 5–6 broad, article 2 of pereopods 5–6 not setose posteriorly, pereopod 7 ordinary, article 2 naked ventrally, article 3 ordinary, dactyl normal.

Epimera 1–2 lacking (type) or bearing numerous long posterior setae, without midfacial setae above ventral facial ridge; epimeron 3 ordinary, urosomite 1 generally naked except for ventral bundle or for sparse apicoventral setae near base of uropod 1; urosomite 3 with dorsal hook or special process. Peduncle of uropod 1 normally elongate, without apicoventral spike, without special enlarged apicolateral or medial spine, peduncular apices of uropods 1–2 not combed, inner ramus of uropod 1 with 1 row of marginal spines (or none), no rami continuously spinose to apex, inner ramus of uropod 2 ordinary, uropod 3 ordinary, bearing long article 2 of outer ramus, carrying 2 medium apical setae. Telson ordinary, with 1–2 apical spines plus setules on each lobe, with special lateral setae.

Description.—Rostrum constricted, small to obsolescent. [Fuzz on article 1 of antenna 1 in male unknown, calceoli on male primary flagellum of antenna 1 unknown, calceoli on male antennae 2 unknown.] Prebuccal parts ordinary, poorly separated from each other, upper lip dominant. Right lacinia mobilis bifid, thin, article 1 of mandibular palp short, palp medium to thin, apex of article 3 oblique, article 2 without outer setae; lower lip bearing or lacking [type] cones; outer plate of maxilla 1 with 11 spines, one spine especially thickened; inner plates of maxilliped with one main apical spine, ordinarily setose. Coxae 2–4 without special anterodorsal humps. Some posterior spines on article 6 of pereopods 3–4 thin and seta-like, others thick and stiff, midapical spine or seta present, often especially enlarged; article 2 of pereopod 7 without facial setae. Peduncle of uropod 1 with dorsolateral spines confined apically, medial spines confined apically; peduncle of uropod 2 with only one medial spine or setule confined apically; peduncle of uropod 3 lacking extra subapical setae or spines. Telson with ordinary pair of midlateral or dorsal setules on each side.

Composition: *cornutus* (Schellenberg, 1931); *minimus* J. L. Barnard (1960).

KEY TO THE SPECIES OF *MICROPHOXUS*

1. Facial spine count on article 4 of antenna 2 = 1-3-4-4, spines thick .... *cornutus*
– Facial spine count on article 4 of antenna 2 = 0-5-1, several spines thin and elongate .... *minimus*

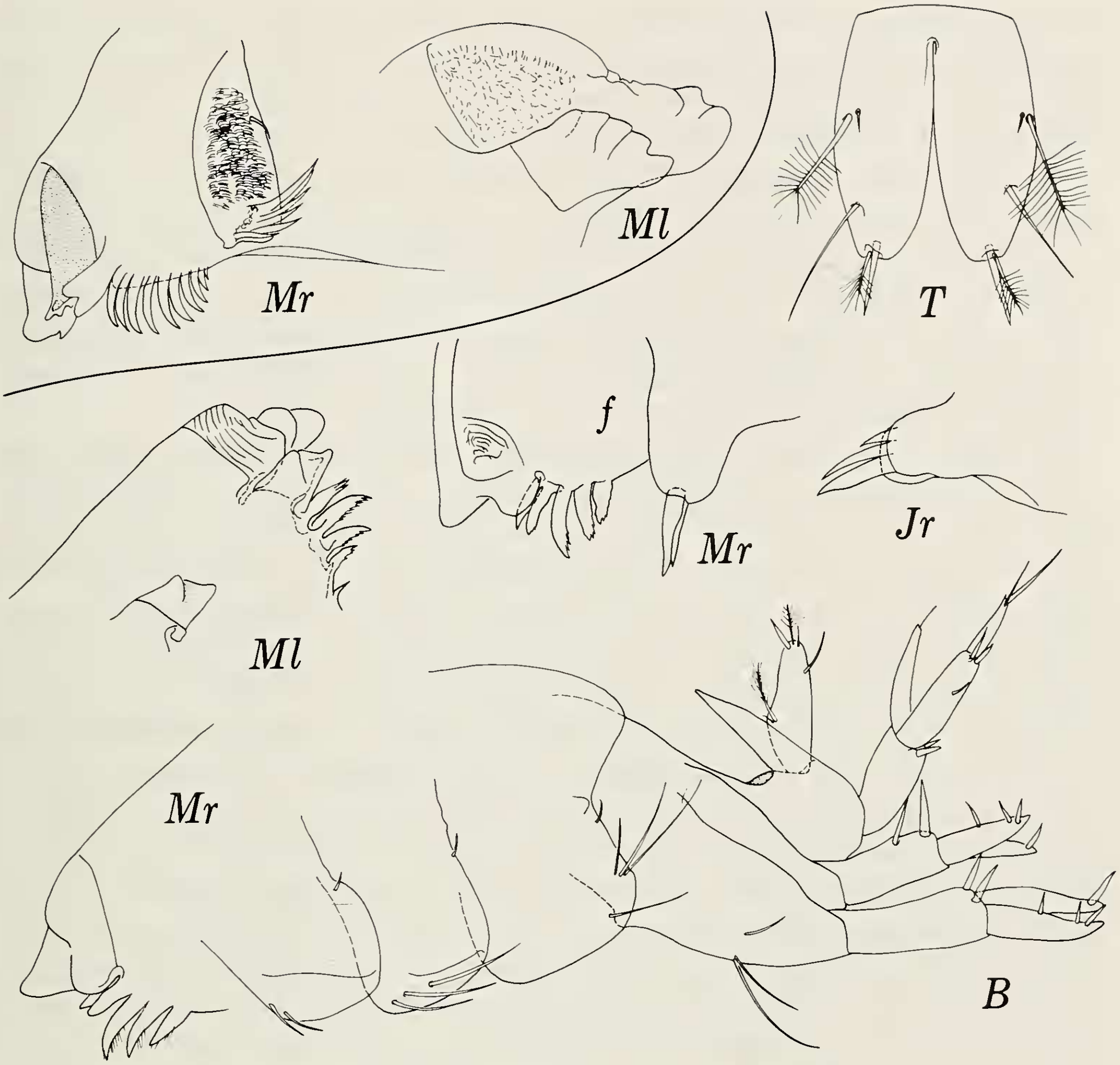

Fig. 1. Upper, *Metharpinia jonesi,* female "x" 4.04 mm; juvenile "y" 1.90 mm. Lower, *Microphoxus minimus,* female "u" 1.90 mm.

Microphoxus minimus J. L. Barnard
Fig. 1 lower

Microphoxus minimus J. L. Barnard, 1960: 291, plate 46.

Description of juvenile "u."—Head about 19% of total body length, greatest width about 85% of length, rostrum constricted, narrow, short, not reaching apex of article 1 on antenna 1. Eyes very small, clear of pigment, ommatidia few and ordinary. Article 1 of peduncle on antenna 1 about 1.3 times as long as wide, about twice as wide as article 2, ventral margin with about 6 setules, weakly produced dorsal apex with 2 setules-setae, article

2 about 0.60 times as long as article 1, with ventral row of 4–5 setae between Marks 60 and 70, primary flagellum with 5 articles, about 0.5 times as long as peduncle, bearing one short aesthetasc each on articles 4–5, accessory flagellum with 4 articles. Spine formula of article 4 on antenna 2 = 0-5-1, distal 5 very long, dorsal margin with notch bearing 4 setae, ventral margin with 5 groups of 1–2 long to medium setae plus setules, one ventrodistal long thin spine, article 5 about 0.85 times as long as article 4, facial spine formula = 1 thin, dorsal margin bearing 1–2 sets of setules, ventral margin with 3 sets of 1–2 long to medium setae, 3 ventrodistal long to medium spines scarcely set facially, flagellum about as long as articles 4–5 of peduncle combined, with 5 articles, article 1 elongate.

Mandibles with weak palpar hump, right incisor with 3 blunt teeth, left incisor with 3 obsolescent teeth in 2 branches, right lacinia mobilis deeply bifid or biramous, distal branch not shorter than proximal, both narrow, simple, pointed, left lacinia mobilis flake-like, broad, weakly bifid, right rakers 3, left rakers 4 plus 1 rudimentary, molars composed of bulbous protrusions, right and left molars with 3 primarily long spines, no spine disjunct, molars without plume, palp article 1 short, article 2 with 1 short inner apical setule, no other setae, article 3 about 1.1 times as long as article 2, oblique apex with 6 spine-setae, basofacial formula = 0. Inner plate of maxilla 1 especially small bearing one medium apical pluseta, no others, palp article 2 subtruncate, with 1 apical spine, 1 apicolateral, one apicomedial, and 3 submarginal setae; inner plate of maxilla 2 scarcely shorter than outer, outer broader than inner, outer with one apicolateral seta, inner with 1 medial seta; inner plate of maxilliped with 1 large thin apical spine, 3 apicofacial setae, 3 medial setae, outer plate with 3 medial spines and 2 medial setae, no apicolateral setae or spines, palp article 1 without apicolateral seta, article 2 with 1 apicolateral seta, medial margin of article 2 weakly setose, article 3 with 3 facial setae in triangle, 1 lateral seta, nail of article 4 long, with second large setal nail and 1 accessory setule.

Coxa 1 expanded apically, anterior margin convex, posterior straight then slightly curving posteriorly to sharp apex, main ventral setae of coxae 1–4 = 15-4-4-3, posteriormost seta of coxae 2–4 slightly shortened, anterior and posterior margins of coxa 4 almost parallel, posterior margin convex, posterodorsal corner sharp-rounded, posterodorsal margin short, v-shaped, width-length ratio of coxa 4 = 2:3. Gnathopods generally ordinary but stout and palms almost transverse, anterior margins of hands somewhat heavily setose, width ratios on articles 5–6 of gnathopods 1–2 = 33:32 and 33:32, length ratios = 66:51 and 65:47, palmar humps ordinary, palms weakly oblique, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded.

Pereopod 4 stouter than pereopod 3 especially on article 4, facial setae formula on article 4 = 3 and 4, almost parallel to apex, on article 5 = 3 and

2, main spine of article 5 extending to M. 95 on article 6, article 5 with no proximoposterior spines and no proximal setae, spine formula of article 6 = 3 + 3 and 3 + 5, plus large middistal spine, some spines especially long; acclivity on inner margin of dactyls of pereopods 3–4 obsolescent, emergent setule almost fully immersed, midfacial pluseta absent. Coxae 5–7 posteroventral setule-seta formula = 2-3-1. Articles 4–5 of pereopods 5–6 broad, facial spine rows moderately developed, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 60:56:53:23, of pereopod 6 = 80:64:40:17, of pereopod 7 = 79:17:14:6, length ratios of pereopod 5 = 105:59:53:35, of pereopod 6 = 103:72:48:60, of pereopod 7 = 100:18:17:28, article 3 of pereopod 7 enlarged, article 2 exceeding apex of article 4, with 4 medium posterior serrations, medial apex of article 6 coarsely combed and bearing 1–2 digital processes. Posteroventral corner of epimeron 1 rounded, posterior margin weakly convex, anteroventral margin with 2 medium stout setae, posteroventral face without setae; posteroventral corner of epimeron 2 rounded, posterior margin convex, facial setae = 3; posteroventral corner of epimeron 3 rounded, weakly protuberant, posterior margin straight, with 3 posteroventral setae tightly grouped, ventral face with 1 seta situated posteriorly; epimera 1–3 with large setule on posterodorsal margin set in weak notch.

Rami of uropods 1–2 without true apical nails, outer rami of uropods 1–2 with 2 accessory nails, inner with 1, outer ramus of uropod 1 with 1 dorsal spine, inner with none, outer ramus of uropod 2 with 1 dorsal spine, inner with none, peduncle of uropod 1 with no basofacial setae and 1 apicolateral spine, medially with 1 apical spine, peduncle of uropod 2 with 2 dorsal spines, medially with one small apical spine, apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 1 large ventral spine, dorsally with 1 small lateral spine, 1 small medial spine, rami feminine, inner extending to M. 95 on article 1 of outer ramus, apex with 1 seta, medial and lateral margins naked, article 2 of outer ramus elongate, 0.50, bearing 2 medium setae, apicomedial margin of article 1 with pair of small setae, lateral margin with 1 acclivity, spine formula = 1–2, setal formula = 0. Telson especially long, length-width ratio = 13:10, not fully cleft, each apex of medium width, subtruncate, weakly excavate, bearing ordinary lateral setule, spine next medial longer than setule, one side with extra setule, ventral face on each side with long seta, midlateral setules highly diverse, largest of giant proportions. Articulation line of urosomite 1 incomplete, lateral surface with one seta, urosomite 3 with large hook dorsally on each side.

Holotype.—As described by Barnard (1960) with following additional description: Primary flagellum of antenna 1 with 6 articles, accessory flagellum with 5; article 2 of antenna 1 with 5 ventral setae in main row; primary flagellum about 60 percent as long as peduncle. Flagellum of antenna 2 with

7 articles. Inner plate of maxilla 1 with only 2 setae (normal phoxocephalid with 4 setae, juvenile "u" of this species with only one seta). Epimeron 3 with 3 ventral setae. Outer ramus of uropod 2 with 2 dorsal spines; inner ramus of uropod 3 with 2 setae.

Juvenile "y."—Rami of uropods 1–2 lacking marginal spines.

Material.—Five specimens from the original type-lot, including the holotype and 2 newly designated voucher specimens, juvenile "u," 1.90 mm and juvenile "y" 1.90 mm long.

Distribution.—Only the type-locality, Playa Blanca, Costa Rica, 10°56′00″N, 82°52′50″W, 3–5 fms, sand shell, 8 February 1935, material in Allan Hancock Foundation.

Microphoxus cornutus (Schellenberg), new combination
Figs. 2, 3 upper

Metharpinia cornuta Schellenberg, 1931:68–69, fig. 35.
Paraphoxus cornutus.—J. L. Barnard, 1960:271.

Description of female "w."—Head about 18% of total body length, greatest width about 75% of length, rostrum constricted, narrow, short, not reaching middle of article 2 on antenna 1. Eyes medium, clear of pigment, ommatidia ordinary. Article 1 of peduncle on antenna 1 about 1.3 times as long as wide, about 1.8 times as wide as article 2, ventral margin with about 8 setules, weakly produced dorsal apex with 2 setules-setae, article 2 about 0.83 times as long as article 1, with ventral crescent of 9 setae, primary flagellum with 9 articles, about 0.6 times as long as peduncle, bearing 1 short aesthetasc each on articles 5–8, accessory flagellum with 8 articles. Spine formula of article 4 on antenna 2 = 1-3-4-4, spines short, dorsal margin with notch bearing 1 seta and 1 spine, ventral margin with 7 groups of 1–3 long to short setae, 1 ventrodistal long spine, article 5 about 0.8 times as long as article 4, facial spine formula = 3, dorsal margin naked, bearing 2 sets of small setae, ventral margin with 5 sets of 1–2 long to short setae, 3 ventrodistal long to medium spines placed subfacially, flagellum about 0.9 times as long as articles 4–5 of peduncle combined, with 11 articles. Epistome and upperlip distinctly articulate, together forming obtuse triangle from side view.

Mandibles with weak palpar hump, right incisor with 3 teeth, left incisor with 3 humps in 2 branches, right lacinia mobilis bifid, distal branch not shorter than proximal, both proximal branches simple, pointed, left lacinia mobilis with 4 weak teeth, right rakers 9, left rakers 9 plus 2 rudimentaries, molars composed of short protrusions, demarcated mainly by spines, right molar with 4 primarily medium spines plus 1 vestigial broad spine weakly disjunct, left molar with 6 primarily medium spines, plus 1 vestigial short spine weakly disjunct, no molar with plume, palp article 1 short, article 2

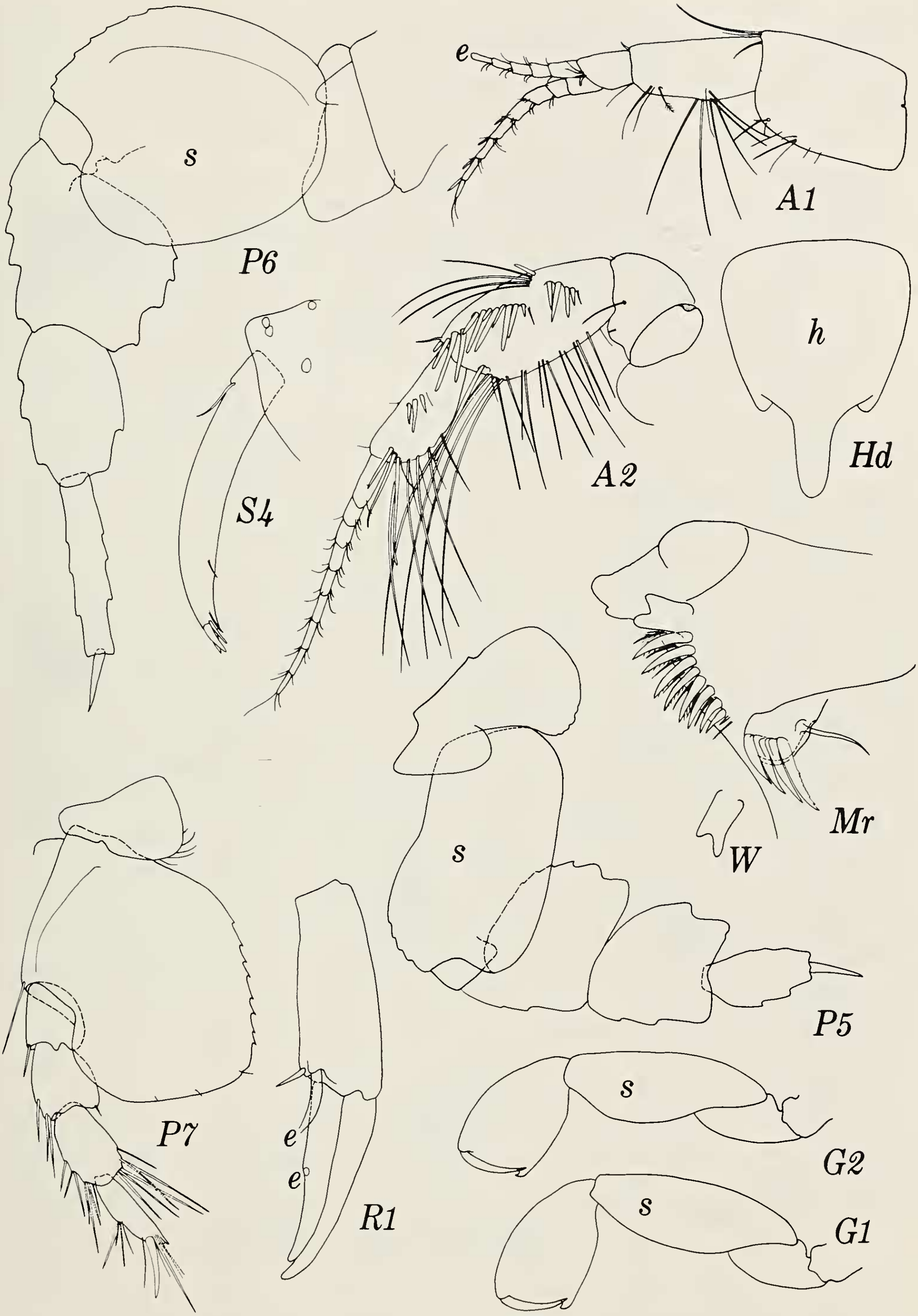

Fig. 2. *Microphoxus cornutus*, female "w" 5.09 mm.

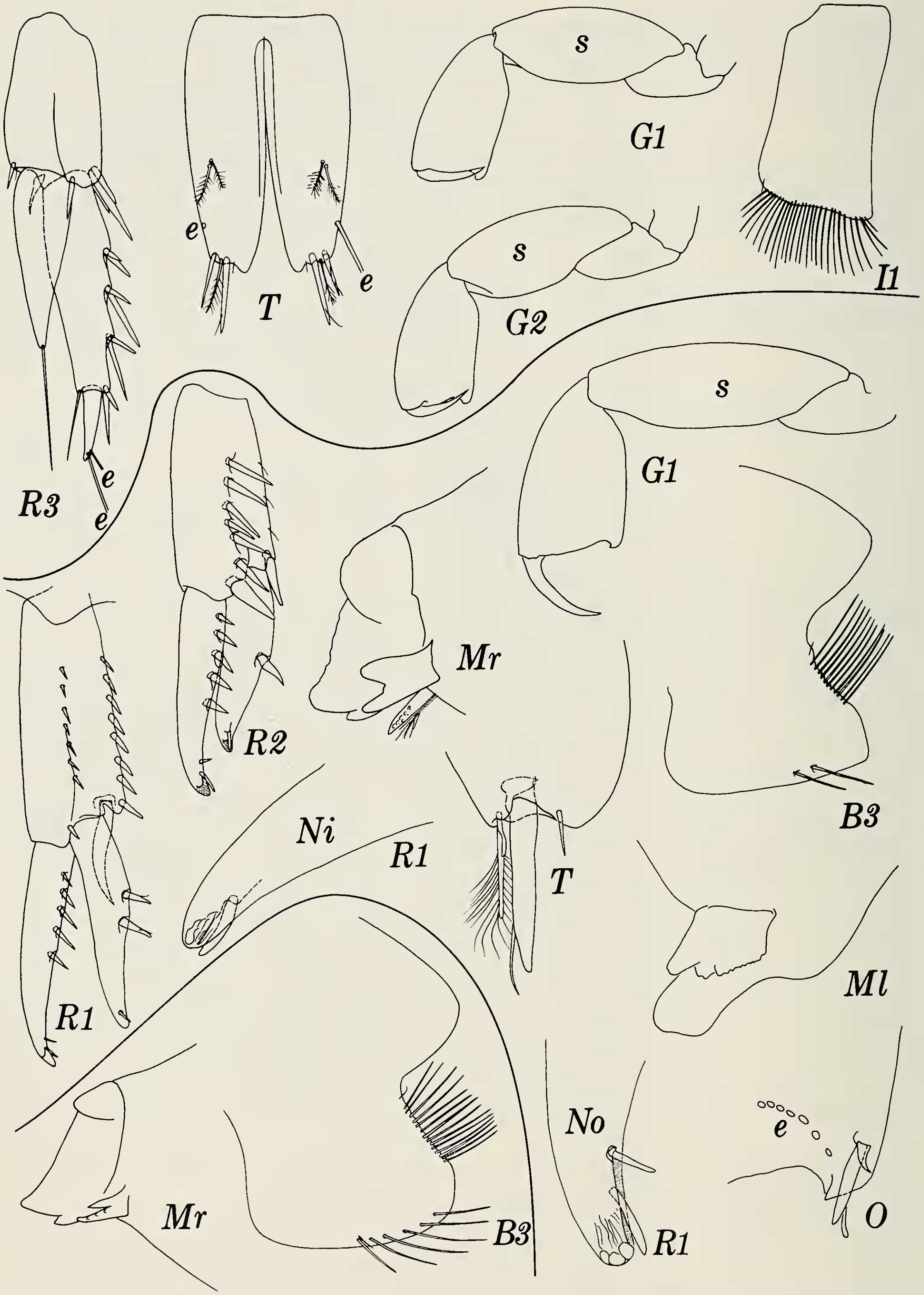

Fig. 3. Upper, *Microphoxus cornutus,* female "w" 5.09 mm. Middle, *Metharpinia coronadoi,* holotype, female "t" 6.57 mm. Lower, *Metharpinia oripacifica,* female "x" 4.0 mm.

with 1 short inner apical seta and 2–3 other short inner setae, article 3 about 1.2 times as long as article 2, strongly oblique apex with 9 spine-setae, basofacial formula = 1-1. Inner plate of maxilla 1 large, broad, bearing one medium apical pluseta, one similar apicomedial seta, 2 apicolateral slightly shorter setae, palp article 2 with 1 apical and 3 medial marginal spines and 1 apicolateral and 9 submarginal setae; maxilla 2 thin, plates extending subequally, outer broader than inner, outer with 2 apicolateral setae, inner with 1 medial seta; inner plate of maxilliped with 1 large thick apical spine, 2 apicofacial setae, 6 medial setae, outer plate with 6–7 medial spines, no apicolateral setae, palp article 1 with 1 apicolateral seta, article 2 with 4 groups of 4 lateral setae, medial margin of article 2 moderately setose, article 3 with 5 facial setae, 2 lateral setae, nail of article 4 unknown (broken), said to be well developed.

Coxa 1 scarcely expanded apically, anterior margin almost straight, main ventral setae of coxae 1–4 = 27-10-9-5 (and 7–8 posterior setae on coxa 4), posteriormost seta of coxae 1–3 very short, coxa 1 with weak posteroventral extension as in *Microphoxus minimus,* anterior and posterior margins of coxa 4 strongly divergent, posterior margin oblique, almost straight, posterodorsal corner rounded, posterodorsal margin ordinary, weakly concave, width-length ratio of coxa 4 = 13:17. Gnathopods generally ordinary, similar to *M. minimus,* width ratios on articles 5–6 of gnathopods 1–2 = 25:28 and 25:27, length ratios = 65:48 and 65:47, palmar humps slightly enlarged, palms almost transverse, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded-flat, long, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded. Pereopods 3–4 similar, facial setae formula on article 4 = 7 and 8, almost parallel to apex, on article 5 = 7 and 6, main spine of article 5 extending to M. 85-75 on article 6, article 5 with no proximoposterior spines, and setae absent basally, spine formula of article 6 = 5 + 7 and 6 + 8 plus large middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 obsolescent, emergent setule ?absent, midfacial pluseta ordinary but posteriad. Coxae 5–7 posteroventral setule-setae formula = 5-15-4. Articles 4–5 of pereopods 5–6 broad, facial spine rows dense to moderately developed, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 60:61:50:21, of pereopod 6 = 80:65:38:14, of pereopod 7 = 82:17:11:5, length ratios of pereopod 5 = 102:54:51:41, of pereopod 6 = 102:70:58:58, of pereopod 7 = 100:18:18:25, article 3 of pereopod 7 enlarged, article 2 exceeding apex of article 4, posterior margin with 8 small serrations, medial apex of article 6 coarsely combed and bearing 2 digital processes.

Postventral corner of epimeron 1 rounded, posterior margin deeply convex, serrate, setose (3), anterior and ventral margins with 7 long setae; posteroventral corner of epimeron 2 rounded, weakly protuberant, posterior margin weakly convex, serrate, setose (4), facial setae = 9; posteroventral corner of epimeron 3 rounded, weakly protuberant, posterior margin almost straight, serrate, setose (4), ventral margin naked, face with oblique row of 4 setae extending from ventral-posterior margin to middle; epimera 1–3 with setule on posterodorsal margin set in weak notch.

Rami of uropods 1–2 without true apical nails, outer rami of uropods 1–2 with 2 accessory nails, inner with 1, outer ramus of uropod 1 with 3 dorsal spines, inner with 1, outer ramus of uropod 2 with 2–3 dorsal spines, inner with 1 dorsomedial spine; peduncle of uropod 1 with no basofacial setae and 1 apicolateral spine, medially with 1 marginal setule and 1 apical spine; peduncle of uropod 2 with 3 dorsal spines, medially with 1 medium apical spine (like larger of inner ramus), apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 5 ventral spines, dorsally with 1 lateral spine, 1 medial spine and setule, rami feminine, inner extending to M. 75 on article 1 of outer ramus, apex with 1 seta, medial and lateral margins naked, article 2 of outer ramus elongate, 0.34, bearing 2 medium setae, apicomedial margin of article 1 with 1 seta, lateral margin with 3 acclivities, spine formula = 2-2-2-2, setal formula = 0. Telson especially long, length-width ratio = 8:5, almost fully cleft, each apex of medium width, subtruncate, but then produced medially, apex bearing medium lateral and long medial spines separated by medium to long setule, with at least 1 long thick lateral seta each side, midlateral setules apicad, weakly diverse, larger of medium size. Urosomite 1 without setule at base of uropod 1, with ventral setal brush, articulation line almost absent, urosomite 3 with large hook dorsally on each side.

Telson possibly with other lateral setae but sockets not clear.

Male "s" and female "t": Telson with 1 long lateral seta on each side; article 2 of uropod 3 with 1 medium, 1 elongate apical setae, the medium seta as long as article 2, the longer seta twice as long; young male not sufficiently advanced to warrant description; terminal male unknown.

Material.—Female "w," 5.09 mm, Punta Arenas [Tierra del Fuego, Chile], Sandboden mit Algen, 4 XII 95, 323, Swedish State Museum 2699. Juvenile male "s" 4.19 mm, and female "t" 4.24 mm, Gallardo HKK2, (east end of Magellan Strait), 11 m, 12-4-76, fine sand.

Relationship.—This species differs from *M. minimus* in: (1) the multiple spine formula on article 4 of antenna 2, the spines being short; (2) the more strongly spinose mandibular molar, with 5–6 spines in contrast to 3 on *minimus*; (3) the presence of four setae on the inner plate of maxilla 1, in contrast to 1 seta for *minimus*; (4) the presence of posterior setae on coxa 4; (5) the presence of posterior setae on epimera 1–2; (6) the wide span of the posterior setae on epimeron 3.

Microphoxus minimus is clearly much more apomorphic in its characters than is *M. cornutus,* the former being very close to the condition of the subfamily Brolginae because of the reduction in armaments on antenna 2, mandibular molar and epimeron 3.

Distribution.—South America, southern tip at Punta Arenas and Ushuaia, 1–15 m.

Metharpinia Schellenberg, revised

Metharpinia Schellenberg, 1931:65 (*Metharpinia longirostris* Schellenberg, 1931, selected by Barnard and Drummond, 1978).—Barnard and Drummond, 1978:415.

Diagnosis.—Eyes present. Flagella of antennae 1–2 unreduced in female, article 2 of antenna 1 ordinary, ventral setae widely spread. Article 1 of antenna 2 not ensiform, article 3 with 2 setules, facial spines on article 4 in 2 or more rows, article 5 ordinary in size.

Right mandibular incisor with 3 teeth, molar not triturative, small, pillow-shaped, bearing 4 or more splayed spines, usually not bearing fuzz, palpar hump small. Palp of maxilla 1 biarticulate, inner plate with 4 setae; setation of maxilla 2 ordinary; inner plates of maxillipeds ordinary, apex of palp not protuberant, dactyl elongate, apical nail mostly immersed.

Gnathopods small, similar, gnathopod 2 weakly or not enlarged, article 5 of gnathopods elongate, without eusirid attachment, palms oblique, hands ordinary, ovatorectangular, moderately to poorly setose anteriorly. Article 5 of pereopods 3–4 setose posteroproximally, article 3 of pereopod 5 of broad form, articles 4–5 of pereopods 5–6 broad, article 2 of pereopods 5–6 not setose posteriorly, pereopod 7 ordinary, article 2 naked ventrally, article 3 ordinary, dactyl normal.

Epimera 1–2 bearing numerous long posterior setae, without midfacial setae above ventral facial ridge, epimeron 3 of "ordinary" classification and diverse. Urosomite 1 without large lateral facial spines, bearing one or more midventral crescents or bundles of setae, or generally naked except for sparse apicoventral setae or spines near base of uropod 1, urosomite 3 without dorsal hook or bearing vestigial process. Peduncle of uropod 1 normally elongate, without apicoventral spike, with displaced enlarged apicolateral spine, peduncular apices of uropods 1–2 not combed, inner ramus of uropod 1 with 1 row of marginal spines, some rami continuously spinose to apex (with accessory apical nails), inner ramus of uropod 2 ordinary, uropod 3 ordinary, bearing article 2 of outer ramus, carrying 2 short to long apical setae. Telson ordinary, with 1–4 apical spines or setae on each lobe plus setules, with special dorsal and lateral spines or setae.

Description.—Rostrum fully developed, constricted. Fuzz on article 1 of antenna 1 in male[unknown], calceoli on male primary flagellum of antenna 1[unknown], calceoli on article 5 and flagellum of male antenna 2[unknown]. Prebuccal parts ordinary, poorly separated from each other, upper lip dominant. Right lacinia mobilis bifid, flabellate or thin, article 1 of mandibular palp short, palp medium to thin, apex of article 3 oblique, article 2 without outer setae; lower lip bearing or lacking cones; outer plate of maxilla 1 with 11 spines, one spine especially thickened; inner plates of maxilliped with 1–2 main apical spines, ordinarily setose. Coxae 2–4 without special anterodorsal humps. Posterior spines on article 6 of pereopods 1–2 thick and stiff, midapical spine present, often especially enlarged; article 2 of pereopod 7 without facial setae. Peduncle of uropod 1 with dorsolateral spines confined apically, medial spines confined apically or widely spread, peduncle of uropod 2 with 1 medial spine confined apically or spines widely spread; peduncle of uropod 3 lacking extra subapical setae or spines. Telson with ordinary pair of basolateral or dorsal setules on each side.

Composition.—coronadoi, new species; *floridana* (Shoemaker); *jonesi* (J. L. Barnard); *longirostris* (Schellenberg); *oripacifica,* new species.

Relationship.—This genus is probably the basic American genus of phoxocephalid in the birubiin-parharpiniin group (therefore not harpiniin, not phoxocephalin) which remains extant and may be slightly more primitive than *Birubius,* the diverse and basic Australian genus. Like *Parharpinia, Metharpinia* has supernumerary dorsal armaments on the telson but differs from *Parharpinia* and *Protophoxus* in the untapering article 2 of pereopod 5. Like *Birubius, Metharpinia* has the untapered article 2 of pereopod 5 but differs in the presence of supernumerary telsonic setation.

The wide span of ventral setae on coxa 1 might be a good generic character for this genus and *Microphoxus* but one species of *Metharpinia* (*jonesi*) unfortunately does not conform.

KEY TO THE SPECIES OF *METHARPINIA*

1. Ventral setae on coxa 1 narrowly spread, epimeron 3 with large tooth .... *jonesi*
– Ventral setae on coxa 1 widely spread, tooth on epimeron 3 small or absent 2
2. Only outer ramus of uropod 2 with accessory apical nail, epimeron 2 with slight posteroventral tooth, ventral setae on epimeron 1 arranged in disjunct groups .... *longirostris*
– All rami of uropods 1–2 with accessory apical nails, epimeron 2 smoothly rounded posteroventrally, epimeron 1 continuously setose ventrally **3**
3. Peduncle of uropod 1 with 7+ lateral spines in adults, inner ramus of uropod 2 with marginal spine, epimeron 3 with only 2–3 ventral setae .... *coronadoi*
– Peduncle of uropod 1 with one lateral spine in adults, inner ramus

of uropod 2 without marginal spines, epimeron 3 with 4+ ventral setae in adults 4
4. Inner plate of maxilliped with 1 stout apical spine .... *floridana*
– Inner plate of maxilliped with 2 stout apical spines .... *oripacifica*

Metharpinia longirostris Schellenberg
Figs. 4, 5 upper

Metharpinia longirostris.—Schellenberg, 1931:65–67, fig. 34; 1935:232.
Paraphoxus longirostris.—J. L. Barnard, 1960:273, pl. 43.

Description of female "x."—Head about 20% of total body length, greatest width about 75% of length, rostrum constricted, narrow, elongate, slightly exceeding apex of article 1 on antenna 1. Rostrum very long and thin but antenna 1 also large. Eyes[dispersed and damaged].

Article 1 of peduncle on antenna 1 about 1.4 times as long as wide, about 1.8 times as wide as article 2, ventral margin with about 9 setules, unproduced dorsal apex with 2 setules-setae, article 2 about 0.83 times as long as article 1, with ventral crescent of 7 setae, primary flagellum with 8 articles, about 0.55 times as long as peduncle, bearing 1 short aesthetasc each on articles 4–7, accessory flagellum with ?6 (broken) articles. Spine formula of article 4 on antenna 2 = 1-3-8-4, dorsal margin without notch but bearing medially 4 setae and 1 spine, ventral margin with 7 groups of 1–4 long to medium setae, 1 ventrodistal long spine, article 5 about 0.73 times as long as article 4, facial spine formula = 3, dorsal margin naked, bearing 2 small setae, ventral margin with 5 sets of 1–2 long to medium setae, 3 ventrodistal long to medium spines set subfacially, flagellum about 0.85 times as long as articles 4–5 of peduncle combined, with 9 articles.

Mandibles with weak palpar hump, right incisor with 3 very weak teeth, left incisor with 3–4 humps in 2 branches, proximal hump forming callus, right lacinia mobilis flabellate, bifid, distal branch little shorter than proximal, both branches broad and short, left lacinia mobilis with 5 teeth, two of these weakly bifid, right and left rakers 8 plus 1 rudimentary, molars composed of bulbous plaques, each molar with 4 primarily stout spines, plus one thin spine strongly disjunct, molar without plume, palp article 1 short, article 2 with 1 short inner apical seta and 2 other short inner setae, article 3 about 1.2 times as long as article 2, oblique apex with 8–9 spine-setae, basofacial formula = 1-1 offset or 0-1. Inner plate of maxilla 1 large, broad, bearing one medium apical pluseta, one long apicomedial seta, 2 short apicolateral setae, palp article 2 with 1 apical spine, 1 apicolateral, 2 medial and 3 submarginal setae; inner plate of maxilla 2 shorter than outer, outer much broader than inner, outer with 3 apicolateral setae, inner with 2 medial setae; inner plate of maxilliped with 1 large thick apical spine, 3

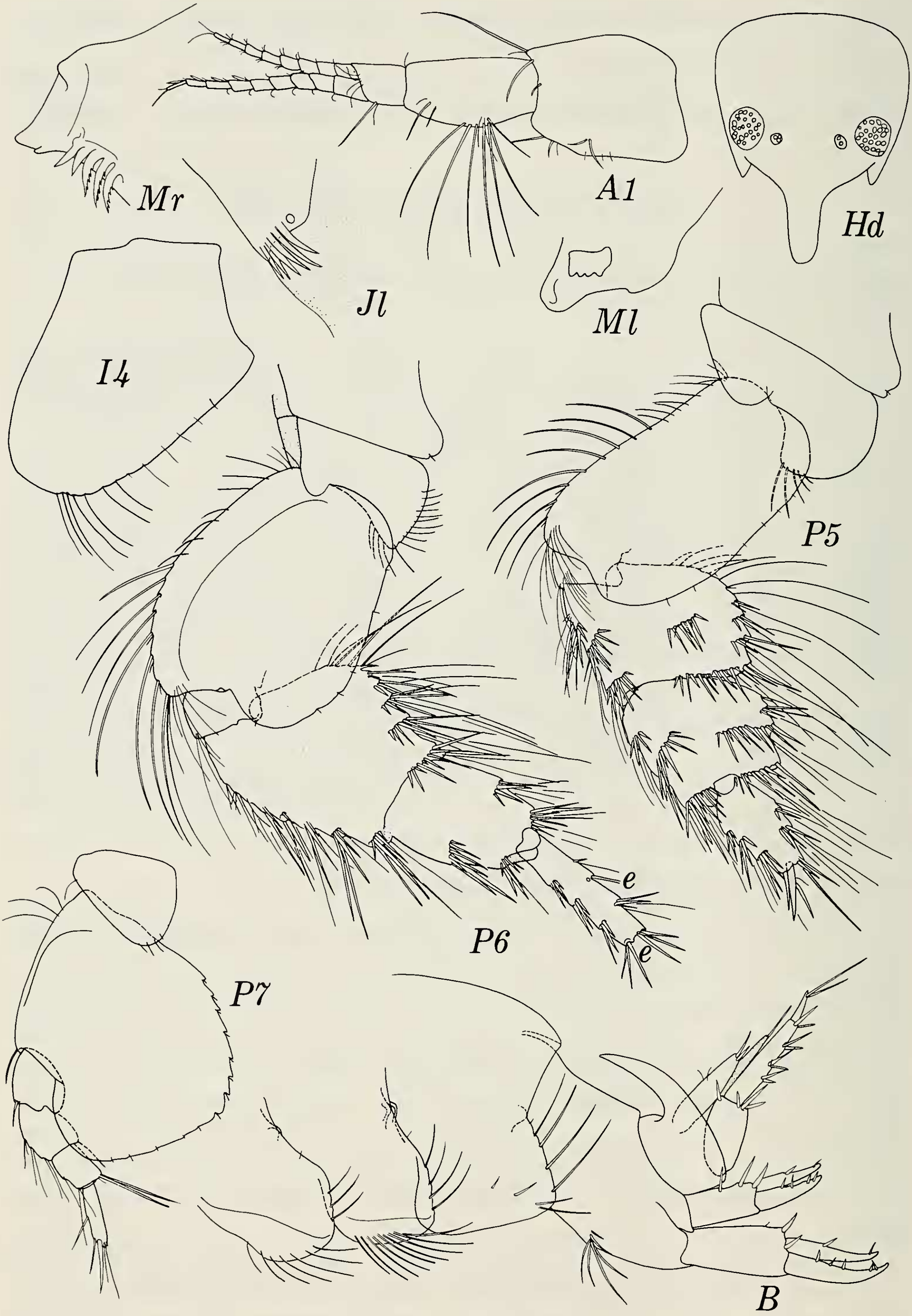

Fig. 4. *Metharpinia longirostris*, female "x" 5.15 mm.

apicofacial setae, 6 medial setae, outer plate with 7 medial spines, no apicolateral setae, palp articles 1–2 with lateral setae, medial margin of article 2 moderately setose, article 3 with 6 strewn facial setae, 1 lateral seta, nail of article 4 short, almost fully immersed and fused, with 3 accessory setules.

Coxa 1 moderately expanded apically, anterior margin almost straight, main ventral setae of coxae 1–4 = 14-6-6-3 (and 6 posterior setae on coxa 4), posteriormost seta of coxae 1–3 shortest, setae of coxa 1 widely spread but sparser than in related species, coxa 1 with weak posteroventral extension as in *Microphoxus minimus,* anterior and posterior margins of coxa 4 divergent, posterior margin oblique, convex, posterodorsal corner rounded, posterodorsal margin short, concave, width-length ratio of coxa 4 = 4:5. Gnathopods generally ordinary but wrists very elongate, width ratios on articles 5–6 of gnathopods 1–2 = 22:26 and 22:26, length ratios = 65:42 and 62:38, palmar humps ordinary, palms almost transverse, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded-flat, long, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded-flat. Pereopod 4 slightly stouter than pereopod 3 especially on article 5, facial setae formula on article 4 = 6 and 5 almost parallel to apex, on article 5 = 6 and 5, main spine of article 5 extending to M. 85-70 on article 6, article 5 with 2 and 1 proximoposterior spines, but proximal edge naked for long distance, spine formula of article 6 = 5 + 6 and 5 + 7 plus large middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 sharp, produced as tooth, emergent setule short, midfacial pluseta ordinary. Articles 4–5 of pereopods 5–6 broad, facial spine rows dense to sparse, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 54:55:42:20, of pereopod 6 = 87:59:36:13, of pereopod 7 = 83:22:18:10, length ratios of pereopod 5 = 93:50:49:40, of pereopod 6 = 100:65:60:65, of pereopod 7 = 100:25:31:33, article 2 of pereopod 5 almost reaching apex of article 4, posterior margin with 8 small serrations, medial apex of article 6 very finely combed, bearing 7–8 digital processes.

Posteroventral corner of epimeron 1 rounded, posterior margin straight below, then weakly convex, serrate, setose (4), corner without setule, anteroventral corner subquadrate, anterior face and margin with 5 long medium setae, posteroventral face with 2 long setae set horizontally above margin; posteroventral corner of epimeron 2 rounded, posterior margin straight below, weakly convex above, serrate, setose (7), facial setae = 6; posteroventral corner of epimeron 3 rounded-quadrate, posterior margin weakly convex, serrate, setose (5), these setae widely spread on dorsal ⅔ of margin, ventral margin with 2–3 setae near posterior margin; epimera 1–3 with small setule on posterodorsal margin set in weak notch.

Rami of uropods 1–2 without apical nails, outer rami of uropod 1 with one internal vestige or socket of accessory nail, outer rami of uropod 2 with one

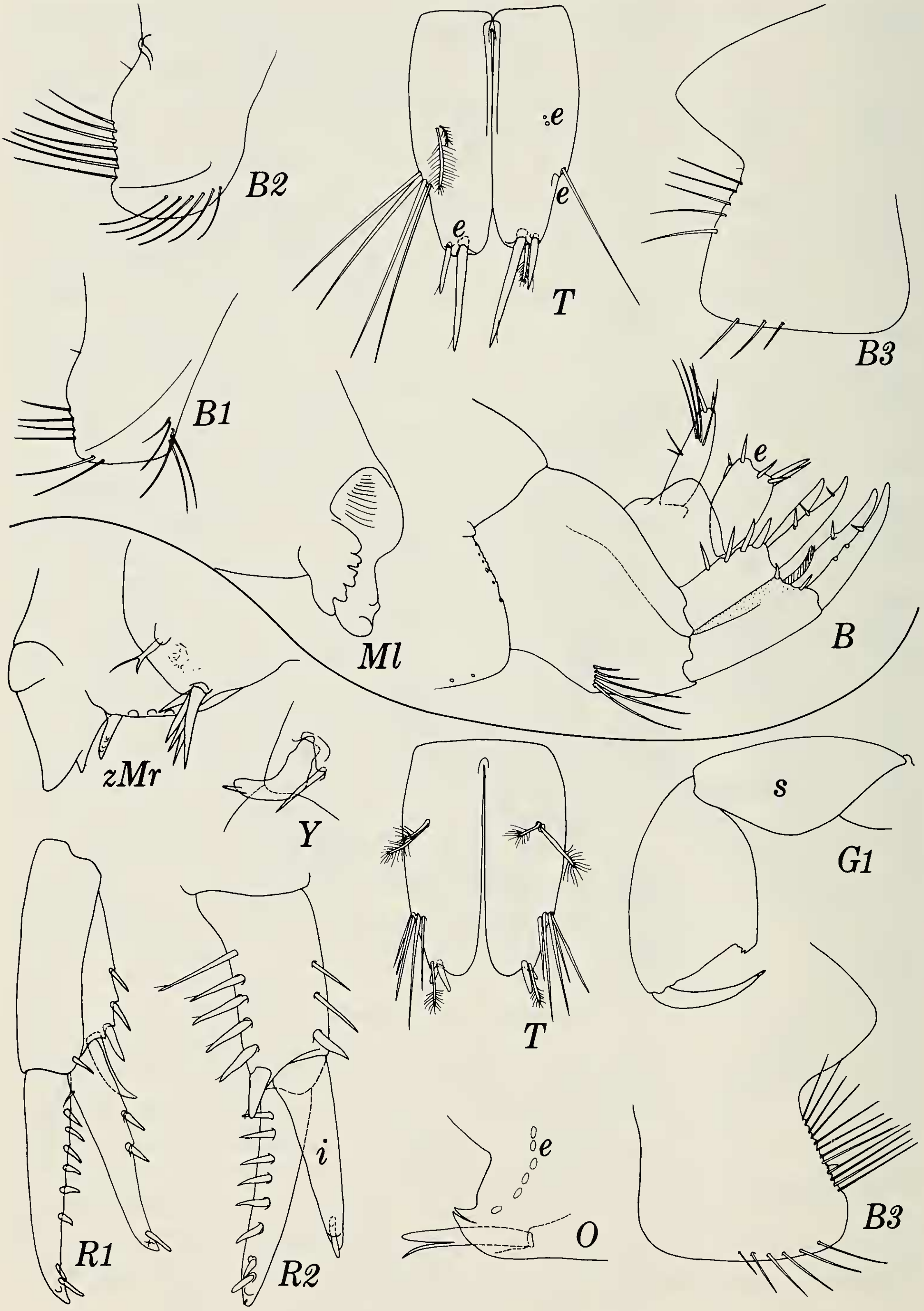

Fig. 5. Upper, *Metharpinia longirostris,* female "x" 5.15 mm. Lower, *Metharpinia floridana,* female "r" 6.93 mm; z = female "z" 6.45 mm.

subapical accessory nail-spine, outer ramus of uropod 1 with 3 dorsal spines, inner with 1, outer ramus of uropod 2 with 2 dorsal spines, inner with no dorsomedial spines, inner ramus of uropod 2 shortened by invagination into peduncle, peduncle of uropod 1 with no basofacial setae and 1 small apicolateral spine, medially with 1 small apical spine and 1 enlarged displaced apical spine, peduncle of uropod 2 with 4 dorsal spines, apicalmost thick, medially with 1 medium apical spine (same size as penultimate lateral spine), apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 4 ventral spines, dorsally with 1 lateral spine, 1 medial spine and 1 setule, rami missing. Telson thick and fleshy, especially long, length-width ratio = 37:26, fully cleft, each apex of medium width, subtruncate, acclivity absent, with short lateral and long medial spines separated by short setule, each side with brush of 4 long setae, midlateral setules diverse, larger of large size. Urosomite 1 with ventral brush of setae, articulation line incomplete but long, urosomite 3 scarcely protuberant dorsally.

Remarks.—Female "x" in 3 pieces in poor condition, body soft, rami of uropod 3 missing; epistome and upper lip destroyed; lower lip lacking cones but edematous and cones possibly destroyed; palp of maxilla 1 definitely 2-articulate and outer plate with 11 spines.

Material.—Female "x," 5.15 mm (in 3 pieces), Valparaiso, [Chile], Swedish State Museum No. 3642.

Relationship.—The single specimen examined differs from Schellenberg's original description mainly in the poor nail on the maxillipedal dactyl; I have not seen the holotype or other material and must leave open the possibility that this specimen is abnormal. This species differs from both species of *Microphoxus* in: (1) right lacinia mobilis broad, flabellate, poorly bifid; (2) presence of disjunct spine on mandibular molar; (3) short and immersed nail on maxillipedal dactyls; (4) dactyls of pereopods 3–4 with sharp tooth and normally medial setule; (5) pereopods 3–4 with 1–2 posteroproximal spines on article 5; (6) normal articles 3–6 of pereopod 7 (in *minimus* and *cornutus* articles 4–6 are reduced in size relative to article 3 so that article 3 appears enlarged); (7) presence of more digital processes on article 6 of pereopod 7 and sparsity of apical combs; (8) uropod 1 with displaced spine on peduncle; (9) lack of tooth on urosomite 3.

Distribution.—South America, Valparaiso to vicinity of La Plata River, 9–13 m.

Metharpinia jonesi (J. L. Barnard), new combination
Fig. 1 upper

Paraphoxus jonesi J. L. Barnard, 1963:463–464, fig. 7; 1969:197.

Description of female "x."—Head about 20% of total body length, greatest width about 65% of length, rostrum constricted, narrow, elongate, spatulate, reaching middle of article 2 on antenna 1. Eyes medium to large, largely occluded with pigment, ommatidia ordinary. Article 1 of peduncle on antenna 1 about 1.6 times as long as wide, about 1.8 times as wide as article 2, ventral margin with about 9 setules, weakly produced dorsal apex with 2 setules-setae, article 2 about 0.8 times as long as article 1, with ventral crescent of 10 setae and 3 apicolateral setae, primary flagellum with 9 articles, about 0.63 times as long as peduncle, bearing 1 short aesthetasc each on articles 4–8, accessory flagellum with 8 articles. Spine formula of article 4 on antenna 2 = 1-3-7-5, dorsal margin without notch but bearing 1 seta and 1 spine widely disjunct, ventral margin with 6 groups of 1–5 long to short setae, 1 ventrodistal long spine, article 5 about 0.8 times as long as article 4, facial spine formula = 3, dorsal margin bearing 2 sets of small setae, ventral margin with 5 sets of 1–4 long to short setae, 1 ventrodistal long seta, 3 subdistal long to medium facial spines, flagellum as long as articles 4–5 of peduncle combined, with 11 articles.

Mandibles with medium palpar hump, right incisor broad, with 3 teeth, left incisor with 3 apical teeth, lateral callus and irregular toothing (illustrated), right lacinia mobilis bifid, distal branch little shorter than proximal, broad, proximal branch simple, pointed, with marginal denticles, left lacinia mobilis with 4 teeth plus 1 accessory tooth, teeth coalesced (illustrated), right rakers 9 plus 1 rudimentary, left rakers 12 plus 1 rudimentary, molars composed of elongate plaques, granulate, right molar with 7 primarily long spines, plus 1 flagellate spine strongly disjunct, left molar with 6 primarily long spines, plus 1 flagellate spine strongly disjunct, no molar with plume, palp article 1 short, naked, article 2 with 1 short inner apical seta and 5 other long and short inner setae, article 3 about 1.25 times as long as article 2, oblique apex with 10 spine-setae, basofacial formula = 0-3. Lower lip with 1 cone on each inner lobe. Inner plate of maxilla 1 ordinary, bearing 1 medium apical pluseta, 1 similar apicomedial seta, 2 apicolateral much shorter setae, palp article 2 with 1 apical spine, 1 apicolateral and 3–4 apicomedial setae, 4–5 submarginal setae; plates of maxilla 2 extending subequally, outer broader than inner, outer with 3 apicolateral setae, inner with 3 medial setae; inner plate of maxilliped with 2 large thick apical spines, 3 apicofacial setae, 6 medial setae, outer plate with 8 medial spines, no apicolateral setae, weak apical cusp, palp article 1 with 2 lateral setae, article 2 with 4 groups of 4 lateral setae, medial margin of article 2 strongly setose, article 3 with 6–8 facial setae in row, 2 lateral setae, nail of article 4 short, almost fully fused, with 2 accessory setules.

Coxa 1 scarcely expanded apically, anterior margin straight, main ventral setae of coxae 1–4 = 13-10-10-9, all but 1–3 very short, posteriormost seta of coxae 1–3 shortest or short, posteriormost seta of coxae 1 and 3 situated on posterior margin, setae of coxa 1 not widely spread, anterior and posterior margins of coxa 4 weakly divergent, posterior margin almost straight, posterodorsal corner sharp-rounded, posterodorsal margin short, weakly concave, width-length ratio of coxa 4 = 8:9. Gnathopods generally ordinary but hands stout, width ratios on articles 5–6 of gnathopods 1–2 = 24:29 and 24:29, length ratios = 65:40 and 57:35, palmar humps ordinary, ornamented (hooked but not slit as in *floridana*), palms weakly oblique, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded, long, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded, short, almost lobate.

Pereopod 4 stouter and longer than pereopod 3 especially on articles 4–5, posterior margin of article 4 more strongly setose on pereopod 4, facial setae formula on article 4 = 7 and 8 almost parallel to apex, on article 5 = 7 and 5, main spine of article 5 extending to M. 75 on article 6, article 5 with 2 or 1 (small) proximoposterior spines, spine formula of article 6 = 6 + 7 and 6 + 7 plus elongate middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 sharp, produced as tooth, emergent setule short, midfacial pluseta ordinary, somewhat proximad. Coxae 5–7 posteroventral setule-seta formula = 17-26-14, mostly short. Articles 4–5 of pereopods 5–6 of ordinary width, to broad, facial spine rows dense, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 55:55:40:15, of pereopod 6 = 77:58:31:13, of pereopod 7 = 80:17:14:8, length ratios of pereopod 5 = 87:61:52:42, of pereopod 6 = 90:65:58:70, of pereopod 7 = 101:20:20:30, article 2 of pereopod 7 reaching apex of article 4, posterior margin with 12 medium serrations, only lateral apex of article 6 scarcely combed, bearing 8 large digital processes. Article 2 of pereopod 5 with weak anterodistal hump.

Posteroventral corner of epimeron 1 with very small tooth, posterior margin weakly convex, serrate, setose (8), corner without setule, ventral margin with 14 long to short setae; posteroventral corner of epimeron 2 with small sharp tooth not guarded by setule sinus, posterior margin weakly convex, serrate, setose (11), ventral facial setae = 11, one middle pair set vertically, upper face with 5 tiny setae in widely spread row; posteroventral corner of epimeron 3 with large tooth, posterior margin straight, serrate, setose (8) with 1 setule notch, ventral margin with 4 setae all posterior but evenly spread, face with 1 tiny seta.

Rami of uropods 1–2 lacking apical nails, outer and inner rami of uropods 1–2 with 1 and 2 accessory nails respectively, outer ramus of uropod 1 with 4 small dorsal spines, inner with 1 larger spine, outer ramus of uropod 2 with 4 larger dorsal spines, inner without spines, peduncle of uropod 1 without basofacial setae, with 1 small apicolateral spine, medially with 3 marginal spines, apicalmost enlarged, proximalmost small, plus 1 large displaced spine, peduncle of uropod 2 with 5 dorsal spines, apicad thick, proximad thin, short, medially with 1 medium apical spine, apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 6 ventral spines, dorsally with 2 lateral spines, 1 medial spine, 1 setule, 1 seta, rami submasculine, inner extending to M. 100 on article 1 of outer ramus, apex with 2 setae, medial margin setose, lateral margin with 2 setae, article 2 of outer ramus elongate, 0.42, bearing 2 short to medium setae, medial margin of article 1 setose, lateral margin with 2 acclivities, spine formula = 3-3-3, setal formula = 0. Telson especially long, length-width ratio = 5:3, almost fully cleft, each apex of medium width to narrow, almost truncate, medial apex slightly protuberant, apex weakly concave, bearing ordinary lateral setule, spine next medial of length equal to setule, next spine elongate, next short (3 spines total), or 2 spines only, 1 long, 1 short, midlateral setules diverse, larger of medium size, with subapical brush of 7–8 setae. Urosomite 1 with 2 tiny lateral setae near base of segment, plus spray of ventral setae emerging onto lateral surface, with articulation line almost absent, urosomite 3 unprotuberant dorsally.

Male "y."—Rostrum narrower than in female. Article 1 of antenna 1 with 16 ventral setules, article 2 with 9 ventral setae, primary flagellum with 10 articles, 1 calceolus each on articles 1–5, aesthetascs absent, accessory flagellum with 8 articles. Facial spine formula of article 4 on antenna 2 = 3-7-4, medial face fuzzy, with group of 1 spine and 2 setae in dorsomedial position (not set truly dorsally), article 5 with 5 dorsal sets of male setae and 1 calceolus, ventrodistal apex with 2 thin spines and 1 setule, flagellar formula of calceoli = 1, 2, 4, 6 . . . n. Right lacinia mobilis broader than in female, basofacial setal formula of article 3 on mandibular palp = 0-3; dactyl of maxilliped with distinct short nail. Coxa 4 not broadened. Pereopods 3–4 more slender than in female; article 2 of only pereopod 7 narrower than in female; apex of article 6 uncombed. Epimera 1–3 scarcely broadened, posterior margin of epimeron 3 not shortened, setae shortened, setal formulas similar to female but posterior setae of epimeron 3 more crowded together towards ventral margin, 6 in number. Uropods 1–2 generally like female; uropod 3 like female but more strongly setose, apical setae on article 2 of outer ramus very short. Telson elongate, only lateralmost distal spine more shortened than in female, denticle rows in single file.

Material.—Female "x" 4.38 mm and male "y" 4.04 mm, southern California, 33°36′54″N, 117°56′48″W, 10.4 m, 16 December 1957, [sea bottom not stated].

Distribution.—Southern California, 0–18 m, sand bottom.

Metharpinia floridana (Shoemaker), new combination

Fig. 5 lower

Pontharpinia floridana Shoemaker, 1933:5–8, figs. 3, 4; 1948:2.
Paraphoxus floridanus. J. L. Barnard, 1960:226–230, pl. 21.

Description of female "r."—Head about 23% of total body length, greatest width about 63% of length, rostrum constricted, spatulate, broad to narrow, elongate, almost reaching apex of article 2 on antenna 1. Eyes medium, stained with pigment, ommatidia ordinary to small. Article 1 of peduncle on antenna 1 about 1.5 times as long as wide, about 2.2 times as wide as article 2, ventral margin with about 13 setules, weakly produced dorsal apex with 2 setules-setae, article 2 about 0.6 times as long as article 1, with ventral, tightly constrained crescent of 8 setae, and 3 lateral setae near apex, primary flagellum with 14 articles, about 0.8 times as long as peduncle, lacking aesthetascs; accessory flagellum with 13 articles. Spine formula of article 4 on antenna 2 = (1-3)-5-4, dorsal margin with notch bearing 2 setae and 1 spine, ventral margin with 5 groups of 4 long to short setae, 1 ventrodistal long spine, article 5 about 0.8 times as long as article 4, facial spine formula = 4, dorsal margin bearing 2 small apical setae, ventral margin with 5 sets of 1–3 long to medium setae, 3 ventrodistal long to medium spines or setae, 1 of these set facially; flagellum almost 1.4 times as long as articles 4–5 of peduncle combined, with 17 articles. Epistome and upper lip forming obtuse triangle from lateral view.

Mandibles with weak palpar hump, right incisor with 3 teeth, left incisor with 3 humps in 2 branches, right lacinia mobilis bifid, distal branch much shorter than proximal, distal branch narrow, simple, proximal branch pointed, with marginal denticles, left lacinia mobilis with 5 teeth, middle teeth scarcely shortened, right rakers 9, left rakers 11, molars composed of bulbous humps, very weakly granulated, on plaque, right molar with 7 primarily long spines plus 1 short bifid (dendritic) spine strongly disjunct, left molar with 6 primarily long spines, plus 1 long spine strongly disjunct, no molar with plume, palp article 1 short, article 2 with 1 long, 1 short inner apical setae and 5–6 other long and short inner setae, and 1 outer seta, article 1 also with 1–2 outer setae, article 3 about 1.1 times as long as article 2, oblique apex with 11–12 spine-setae, basofacial formula = 0-2. Each lobe of lower lip with 1 cone. Inner plate of maxilla 1 ordinary, bearing 1 medium apical pluseta, 1 similar apicomedial seta, 2 apicolateral much shorter setae, palp article 2 with 1 apical spine, 1 apicolateral seta, 2 apicomedial setae, and 3 submarginal setae, plates of maxilla 2 extending subequally, outer scarcely broader than inner, outer with 4 apicolateral setae, inner with 3 medial setae; inner plate of maxilliped very broad, with 1 large thick apical spine, 2 apicofacial setae, 4 medial setae, outer plate with 6 medial spines and 1–2 medial setae, no apicolateral setae or cusp, palp article 1 with 2 lateral setae, article 2 with 6 groups of 7 lateral setae, medial margin of article 2 strongly setose, article 3 with 10 slightly strewn facial setae, 1 lateral seta, nail of article 4 barely distinct or fully fused, with 2 accessory setules.

Coxa 1 scarcely expanded apically, anterior margin straight, main ventral setae of coxae 1–4 = 21-15-11-10 (in 3 groups), widely spread, posteriormost seta of coxae 1–3 strongly shortened, anterior and posterior margins of coxa 4 scarcely divergent, posterior margin convex, posterodorsal corner sharp-rounded, posterodorsal margin short, concave, or weakly undulate, width-length ratio of coxa 4 = 1:1. Gnathopods generally ordinary, width ratios on articles 5–6 of gnathopods 1–2 = 28:38 and 29:37, length ratios = 65:63 and 60:58, palmar humps large, ornamented, palms oblique, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded, short, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded, short, almost produced.

Pereopods 3–4 similar, facial setae formula on article 4 = 7 and 7, almost parallel to apex, on article 5 = 7 and 6, main spine of articles extending to M.85+ on article 6, article 5 with 3 and 3 proximoposterior spines, spine formula of article 6 = 7 + 7 and 7 + 8 plus middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 weak, sharp, produced as tooth, emergent setule short, midfacial pluseta short, position ordinary. Coxae 5–7 posteroventral seta formula = 12-17-7. Articles 4–5 of pereopods 5–6 of ordinary width, facial spine rows sparse to moderately developed, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 52:54:44:20, of pereopod 6 = 83:56:33:14, of pereopod 7 = 85:19:15:8, length ratios of pereopod 5 = 95:53:45:46, of pereopod 6 = 100:63:57:75, of pereopod 7 = 102:22:23:30, article 2 of pereopod 5 almost reaching apex of article 4, posterior margin with 7 small teeth and 1 short ventroposterior seta, anteromedial and lateral apex of article 6 and medial apex of article 5 coarsely combed, also bearing 9 large smooth digital processes on pereopod 7.

Posteroventral corner of epimeron 1 rounded-subquadrate, posterior margin weakly convex and serrate, setose (7), corner without setule, anterior and ventral margins with 15–17 short to medium setae; posteroventral corner of epimeron 2 rounded-subquadrate, posterior margin weakly convex, serrate, setose (9), setae starting well above ventral margin, facial setae = 12 in straight row; posteroventral corner of epimeron 3 narrowly rounded, weakly protuberant, posterior margin almost straight below, excavate above, serrate, setose (12) in dorsal two thirds only, 1 setule notch, ventral margin with 6 setae all in posterior half but evenly spread, face naked.

Rami of uropods 1–2 with fused, immersed, obsolescent apical nails, outer rami of uropods 1–2 with 2 accessory nails, inner rami with 1, outer ramus of uropod 1 with 6 dorsal spines, inner with 2 large, outer ramus of uropod 2 with 6 dorsal spines, inner with none, peduncle of uropod 1 with no basofacial setae and 1 small apicolateral spine, medially with 3 marginal spines, apicalmost enlarged, plus 1 huge displaced spine, peduncle of uropod 2 with 6 dorsal spines, distalmost thick, proximalmost thin and slightly elongate, medially with large apical spine and 3 thin marginal spines, apicolateral corners of peduncles on uropods 1–2 with comb very weak or absent. Peduncle of uropod 3 with 5 ventral spines, dorsally with 1 lateral spine, 1 hooked medial spine and 1 setule, rami submasculine, inner extending to M. 95 on article 1 of outer ramus, apex with 2 setae, medial margin setose, article 2 of outer ramus elongate, 0.40, bearing 2 medium setae, medial margin of article 1 setose, lateral margin with 2 acclivities, spine formula = 3-3-3, setal formula = 0. Telson especially long, length-width ratio = 3:2, almost fully cleft, each apex of medium width, rounded, lateral acclivity weak, bearing ordinary lateral setule, spine next medial shorter than setule, next spine intermediate, lateral margins each with subapical brush of 5 setae, midlateral setules diverse, larger large. Urosomite 1 with 1 midlateral seta, ventral setal bundle riding upward along ventral face, articulation line short, almost absent, urosomite 3 unprotuberant dorsally.

Male "q."—Rostrum slightly narrower than in female; article 1 of antenna 1 with 18 ventral setules, article 2 with 6 ventral setae, primary flagellum with 14 articles, 1 calceolus each on articles 1–7, aesthetascs absent, accessory flagellum with 12 articles. Facial spine formula on article 4 of antenna 2 = 3-4-4, article 5 = 3, also with 3 dorsal sets of male setae and 1 calceolus, ventrodistal apex with 2 thin spines and one setule, calceolus formula on elongate flagellum = 2, 3, 5, 7 . . . n or 1, 2, 3, 4, 6, 8 . . . n. Basofacial setal formula of article 3 on mandibular palp = 0-2. Coxa 4 not broadened. Article 2 of only pereopod 7 narrower than in female. Epimera 2–3 broadened, posterior margin of epimeron 3 not shortened; setal formulas, epimeron 1 ventral = 18, posterior = 4, epimeron 2 facial = 12, posterior = 9, epimeron 3 posterior = 12, facial = 0, ventral = 5. Urosomite 1 with 2 small facial setae. Spine formulas of uropods: uropod 1 peduncle apicolateral = 1, basofacial = 0, uropod 2 peduncle dorsal = 8, basalmost not elongate, dorsal spines on outer ramus of uropod 1 = 4, of uropod 2 = 4, inner ramus of uropod 1 = 2, of uropod 2 = 0, ventral spines on peduncle of uropod 3 = 6, apicomedial corner with spine and 3 setae, spine formula on article 1 of outer ramus = 3-3-4, setal formula = 0. Telson elongate, distal spines scarcely shortened, occasionally 1 lobe with 3 spines, inner short; each denticle stripe composed of aligned or zigzag pairs of denticles.

Female "z."—Right lacinia mobilis simple, perhaps divided so deeply that distal member assuming appearance of raker spine; on antenna 1 last three articles on flagellum before ultimate article each with aesthetasc; 1 telsonic apex with large penicillate setule and 3 spines (situated ventrally); article 2 of mandibular palp with 3 outer setae.

Remarks.—Original description based on male, that male showing only 3 setae in telsonic brush and only one midlateral setule (latter depiction probably erroneous); that male also with posterior edge of epimeron 2 bearing 6 setae, ventral margin of epimeron 3 with 6 setae, posterior margin with 11; coxa 4 with 13 setae; basofacial formula on article 3 of mandibular palp = 0-3. Epimeron 3 of *floridana* similar to figure herein of *coronadoi* thus posterior setae reaching almost to corner in male but not in female.

Large specimens with posteroventral corner of epimeron 3 very broadly rounded and outer ramus of uropod 2 with 6 dorsal spines and almost continuously spinose to meet 2 apical nails.

Material.—Holotype as cited by Shoemaker (1933) reexamined for comments noted in Remarks; Female "r," 6.93 mm and male "q" 6.09 mm, 16 miles off Sapelo Island, Georgia, U.S.A., townet, Fish Hawk Station 8259, 3 May 1915; female "z" 6.45 mm, Beaufort, North Carolina, 31 July 1941, coll. A. S. Pearse; 1 specimen north of Loggerhead Key, Florida, 22 June 1925, 15–20 feet, rock dredge over eel grass; 1 specimen, Tortugas Islands, Florida, 9 June 1925, Fish. 249.

Distribution.—South Carolina to Cuba, 0–3 m.

Metharpinia oripacifica, new species

Fig. 3 lower

Paraphoxus floridanus.—J. L. Barnard, 1960:226–230, pl. 21 (not Shoemaker, 1933).

Description of holotype female "h."—Head about 21% of total body length, greatest width about 67% of length, rostrum constricted, broad, elongate, not reaching middle of article 2 on antenna 1. Eyes medium, clear of pigment (very old), ommatidia ordinary. Article 1 of peduncle on antenna 1 almost 1.7 times as long as wide, about 2.2 times as wide as article 2, ventral margin with about 6 setules, weakly produced dorsal apex with 2 setules, article 2 almost 0.7 times as long as article 1, with tight ventral crescent of 6–7 setae, primary flagellum with 11 articles, about 0.6 times as long as peduncle, bearing short aesthetascs, accessory flagellum with 9 articles. Spine formula of article 4 on antenna 2 = 1-3-5-5, dorsal margin with notch bearing 5 setae and 1 spine, ventral margin with 7 groups of 2–8 long to short setae, 1 ventrodistal medium spine, article 5 about 0.9 times as long as article 4, facial spine formula = 4, dorsal margin bearing 2 sets of short setae, ventral margin with 6 sets of 1–3 medium to long setae, 3 ventrodistal, long to medium spines set slightly facially, flagellum about 0.95 times as long as articles 4–5 of peduncle combined, with 13 articles. Epistome and upper lip forming obtuse triangle from lateral view.

Mandibles with weak palpar hump, right incisor with 3 teeth, left incisor with 4 teeth in 2 humps, right lacinia mobilis bifid, distal branch much shorter than proximal, narrow, sharp, proximal branch pointed, with marginal denticles, left lacinia mobilis with 5 teeth, middle teeth scarcely shortened, right rakers 11 plus 2 rudimentaries, left rakers 13, molars composed of elongate plaques, each with 6 primarily short to medium spines plus one short spine strongly disjunct, molars without plume, palp article 1 short, article 2 with 1 short inner apical seta and 7 other long and short inner setae, article 3 about 1.2 times as long as article 2, oblique apex with 11 spine-setae, basofacial formula = 0-2. Inner plate of maxilla 1 ordinary, bearing 1 long apical pluseta, 1 similar apicomedial seta, 3 apicolateral much shorter setae, palp article 2 with 1 apical spine, 1 apicolateral seta, 1 medial spine, 2 medial setae, and 4 submarginal setae; plates of maxilla 2 extending subequally, outer slightly broader than inner, outer with 3 apicolateral setae, inner with 5 medial setae; inner plate of maxilliped with 2 long thick apical spines, 2 apicofacial setae, 4 medial setae, outer plate with 6 medial spines, 2–3 medial setae, palp article 1 with 2 apicolateral setae, article 2 with 10 lateral setae, medial margin of article 2 moderately setose, article 3 with 5 facial setae, group of 3 lateral setae, nail of article 4 short, with 2 accessory setules.

Coxa 1 scarcely expanded apically, anterior margin convex, main ventral setae of coxae 1–4 = 20-13-?-18, posteriormost seta of coxae 1–3 shortest, anterior and posterior margins of coxa 4 almost parallel, posterior margin almost straight, posterodorsal corner sharp, posterodorsal margin short, concave, width-length ratio of coxa 4 = 1:1. Gnathopods generally ordinary, width ratios on articles 5–6 of gnathopods 1–2 = 27:32 and 25:32, length ratios = 65:61 and 63:57, palmar humps ordinary, palms weakly oblique, article 5 of gnathopods 1–2 elongate, ovate, posterior margin rounded.

Pereopods 3–4 similar; on pereopod 4 only facial setae formula on article 4 = 8, on article 5 = 7, main spine of article 5 extending to M. 100 on article 6, article 5 with no proximoposterior spines, spine formula of article 6 = 6 + 8 plus middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 sharp, produced as tooth, emergent setule short, midfacial pluseta short. Coxae 5–7 posteroventral seta formula = 14:23:10. Articles 4–5 of pereopods 5–6 broad, facial spine rows dense, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 52:51:40:19, of pereopod 6 = 79:50:29:12, of pereopod 7 = 83:15:13:8, length ratios of pereopod 5 = 89:40:49:39, of pereopod 6 = 103:56:50:62, of pereopod 7 = 105:20:19:32, article 2 of pereopod 7 reaching middle of article 4, with 8 small posterior serrations, medial apex of article 6 finely combed.

Posteroventral corner of epimeron 1 rounded, posterior margin straight, weakly serrate, setose (8), corner without setule, anteroventral margin and face with many long to medium setae, posteroventral margin with 5 long setae; posteroventral corner of epimeron 2 rounded, posterior margin straight, weakly serrate, setose (10), facial setae = 10 in row, none in pairs, posteroventral corner of epimeron 3 rounded, posterior margin straight, weakly serrate, setose (16), with 1–2 setule notches, ventral margin with 7 setae mainly posterior but widely spread.

Rami of uropods 1–2 without articulate or fused apical nails, outer and inner rami of uropods 1–2 with one and two accessory nails respectively, outer ramus of uropod 1 with 5 dorsal spines, inner with 2, outer ramus of uropod 2 with 5 dorsal spines, inner with no dorsomedial spines, peduncle of uropod 1 with no basofacial setae and 1 apicolateral spine, medially with 4 marginal setae and spines, and large displaced spine, apicalmost of marginals an ordinary spine, peduncle of uropod 2 with 7 dorsal spines, medially with 1 large apical spine, and margin with 2 pairs of setae, apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 6 ventral spines, dorsally with 1 lateral spine and setule, 1 medial spine, rami submasculine, inner extending to M. 95 on article 1 of outer ramus, apex with 2 setae, medial and lateral margins setose, article 2 of outer ramus elongate, 0.42, bearing 2 medium setae, apicomedial margin of article 1 with several setae, lateral margin with 2 acclivities, spine formula = 2-2-2, setal formula = 0-0-1. Telson especially long, length-width ratio = 10:7, almost fully cleft, each apex wide, rounded, lateral acclivity shallow, narrow, bearing ordinary lateral setule, spine next medial longer than setule, each lobe with dorsolateral brush of 7 setae, midlateral setules diverse, larger member of medium size. Urosomite 1 without lateral setule at base of uropod 1 but ventral brush extending widely onto lateral face at proximal end of segment, articulation line absent, urosomite 3 unprotuberant.

Remarks.—Antenna 2 with weak ensiform lobe on article 1. Although no disjunct greatly enlarged posteroproximal spines occur on article 5 of pereopod 4 (and 3), there is a row of 5 submarginal spine-setae besides the regular posterior setae and in addition there is a set of 3 setules farther removed from the margin.

Female "t."—Spine formula on article 1 of outer ramus on uropod 3 = 3-3-3; each lobe of telson with 3 setae in brush; epimeron 3 with only 2 ventral setae; latter 2 characters unusual in light of large body size.

Female "x."—Apices of peduncles on uropods 1–2 with weak comb; epimeron 3 with 6 ventral setae; each lobe of telson with 6 setae in brush.

Nomenclature.—All of the citation of Barnard (1960) for *P. floridanus* belongs with *M. oripacifica* and *P. coronadoi* as all of that earlier material was from the Pacific Ocean and *P. floridanus* apparently is confined to the Atlantic Ocean and Caribbean Sea.

Holotype.—USNM 172473, female "h," 7 mm, cited in plate 21 of J. L. Barnard (1960).

Type-locality.—Salinas Bay, Costa Rica, 11°03′20″N, 85°43′30″W, 2 fms, coarse sand, 11 February 1935, *Velero III* station 477-35.

Etymology.—Name derived from the Latin words *origo,* source; *pacificus,* peaceful.

Material.—Female "t" 5.09 mm from *Velero III* 257-34 and female "x" 4 mm from *Velero III* 461-35 (cited on plate 21 of Barnard, 1960).

Remarks.—All 3 specimens belong to USNM collections as they were donated many years ago by the Allan Hancock Foundation. Specimens of this species remain in Hancock Foundation collections misidentified as "*Paraphoxus floridanus*" and at some future time must be reidentified; one presumes *floridanus* is confined to the Atlantic Ocean.

Relationship.—Differing from *M. floridana* in the presence of 2 main apical spines on the inner plate of the maxilliped, *M. floridana* having only one main spine. This small difference at the moment consistently reflects the geographic separation of *oripacifica* from *floridana* but may not actually signify more than subspeciation.

These specimens at first appeared more distinctive than later concluded. The model specimen described for the west coast form differed from Atlantic *floridana* in the longer wrists of the gnathopods, the seemingly lower extension of posterior setae on epimeron 3, the full posteriorwards extension of ventral setae on epimeron 1, the simple disjunct molarial spine and finally the presence of 2 main apical spines on the inner plate of the maxilliped. Numerous specimens of east coast *floridana* were examined and all but the final character proved to be figmentary or subject to variation and optical illusion in undissected view sufficient to ameliorate these differences. The only consistent difference found is the maxillipedal spination number. However, only a few west coast specimens have been examined and the variability in east coast specimens is so extreme that there is need for more study as to the possibility of morphological overlap between the Atlantic *floridana* and *oripacifica*. Variability in gnathopods, right lacinia mobilis and molarial disjunct spines suggests that *floridana* on the east coast has an unusually high expression of phenotypes possibly typical of species in impoverished faunas. Phoxocephalid diversity in the west northern Atlantic (6 species) is very low in comparison to California (19+ species) and southern Australia (89+ species).

Distribution.—Pacific Costa Rica at Salinas Bay, Port Culebra and Playa Blanca, 2–10 fms.

Metharpinia coronadoi, new species

Fig. 3 middle

Description of holotype female "t."—Head about 20% of total body length, greatest width about 67% of length, rostrum constricted, weakly spatulate, broad to narrow, elongate, not reaching middle of article 2 on antenna 1. Eyes medium, stained with pigment, ommatidia ordinary to small. Article 1 of peduncle on antenna 1 about 1.7 times as long as wide, about 1.7 times as wide as article 2, ventral margin with about 10 setules, weakly produced dorsal apex with 2 setules-setae. Article 2 about 0.83 times as long as article 1, with ventral tightly constrained crescent of 10 setae and 3 lateral setae near apex, primary flagellum with 12 articles, about 0.8 times as long as peduncle, bearing 1 each short and difficult to distinguish aesthetasc on articles 6–11, accessory flagellum with 11 articles. Spine formula of article 4 on antenna 2 = 1-3-6-6, dorsal margin with notch bearing 2 setae and 1 spine, ventral margin with 5 groups of 2–5 long to short setae, 1 ventrodistal long spine, article 5 about 0.8 times as long as article 4, facial spine formula = 4, dorsal margin bearing 2 sets of small setae, ventral margin with 5 sets of 2–5 long to short setae, 3 ventrodistal long to medium spines or setae, 1 of these set facially, flagellum almost 1.2 times as long as articles 4–5 of peduncle combined, with 15 articles.

Mandibles with weak palpar hump, right incisor with 3 teeth rather poorly developed, left incisor with only 2 humps, right lacinia mobilis broad, bifid, distal branch not shorter than proximal, broad, proximal branch simple, bluntly pointed, with marginal denticle in crotch, left lacinia mobilis with 2–3 teeth plus 1–2 accessory teeth, middle teeth not shortened, right rakers 11 plus 2 rudimentaries, left rakers 10 plus 1 rudimentary, molars composed of elongate, bulbous plaques, weakly granulated, each molar with 7 primarily long spines, plus 1 thin simple spine strongly disjunct, molars without plume, palp article 1 short, article 2 with 1 short inner apical seta and 12 other long and short inner setae, no other setae, article 3 about 1.2 times as long as article 2, oblique apex with 11 spine-setae, basofacial formula = 0–3. Each outer lobe of lower lip with 1 cone. Inner plate of maxilla 1 ordinary, bearing 1 medium apical pluseta, 1 similar apicomedial seta, 2 apicolateral much shorter setae, palp article 2 with 1 apical spine, 1 apicolateral, 3 apicomedial spine and 5 submarginal setae; inner plate of maxilla 2 shorter than outer, outer much broader than inner, outer with 4–5 apicolateral setae, inner with 2 medial setae in pair; inner plate of maxilliped with 2 thick apical spines, 3 apicofacial setae, 6 medial setae, outer plate with 9 medial spines, and 1 medial seta, palp article 1 with 1 apicolateral seta, article 2 with 4 groups of 5 lateral setae, medial margin of article 2 strongly setose, article 3 with 7 scarcely strewn facial setae, 2 lateral setae, nail of article 4 barely distinct but not fully fused, with 2 accessory setules.

Coxa 1 scarcely expanded apically, anterior margin straight, main ventral setae of coxae 1–4 = 16-12-15-6, posteriormost seta of coxae 1–3 strongly shortened, coxa 1 also with 1 small posteroventral seta, anterior and posterior margins of coxa 4 scarcely divergent, posterior margin convex, posterodorsal corner sharp, posterodorsal margin short, concave, width-length ratio of coxa 4 = 20:23. Gnathopods generally ordinary, width ratios on articles 5–6 of gnathopods 1–2 = 22:27 and 20:28, length ratios = 65:42 and 56:37, palmar humps large, ornamented, palms oblique, article 5 of gnathopod 1 elongate, ovate, posterior margin rounded, long, article 5 of gnathopod 2 elongate, ovate, posterior margin rounded, long. Pereopod 4 stouter than pereopod 3 especially on article 4, facial setae formula on article 4 = 7 and 8 almost parallel to apex, on article 5 = 6 and 5, main spine of article 5 extending to M. 80-90 on article 6, article 5 with 2 proximoposterior spines on each pereopod, spine formula of article 6 = 6 + 7 and 6 + 7 plus long middistal spine, some spines especially long, acclivity on inner margin of dactyls of pereopods 3–4 weak, sharp, emergent setule short, midfacial pluseta ordinary. Articles 4–5 of pereopods 5–6 broad, facial spine rows dense to moderately developed, facial ridge formulas of article 2 on pereopods 5–7 = 0-1-1, width ratios of articles 2, 4, 5, 6 of pereopod 5 = 60:54:44:20, of pereopod 6 = 85:62:36:16, of pereopod 7 = 81:19:15:8, length ratios of pereopod 5 = 98:50:51:44, of pereopod 6 = 100:65:65:78, of pereopod 7 = 100:21:20:29, article 2 of pereopod 7 reaching middle of article 5, posterior margin with 11 small serrations and 1 ventroposterior seta, anteromedial and lateral apex of article 6 and medial apex of article 5 coarsely combed, article 6 also bearing 7–8 combed digital processes.

Posteroventral corner of epimeron 1 rounded-quadrate, posterior margin weakly convex and serrate, setose (10), corner without setule, anterior and ventral margins with 18 short to medium setae; posteroventral corner of epimeron 2 rounded-quadrate, posterior margin almost straight, weakly serrate, setose (11), setae starting well above ventral margin, facial setae = 13 in 2 arcs; posteroventral corner of epimeron 3 subquadrate, posterior margin straight below, excavate above, serrate, setose (11), in dorsal two thirds only with 1 setule notch, ventral margin with 2 posterior setae.

Rami of uropods 1–2 with fused, immersed, obsolescent apical nails, outer rami of uropods 1–2 with 2 accessory nails, inner rami with 1, outer ramus of uropod 1 with 5 dorsal spines, inner with 2 large, outer ramus of uropod 2 with 3 dorsal spines, inner with 1 large dorsomedial spine, peduncle of uropod 1 with no basofacial setae and 8 small dorsolateral spines, medially with 8 marginal spines, apicalmost slightly enlarged plus 1 huge displaced spine, peduncle of uropod 2 with 9 dorsal spines, apicalmost thick, proximalmost thin, medially with 1 large apical spine and 3 marginal setules, apicolateral corners of peduncles on uropods 1–2 without comb. Peduncle of uropod 3 with 6 ventral spines, dorsally with 2 lateral spines, 1 medial spine and 2 setules, rami submasculine, inner extending to M. 95 on article 1 of outer ramus, apex with 2 setae, medial and lateral margins setose, article 2 of outer ramus elongate, 0.30, bearing 2 medium to long setae, medial margin of article 1 setose, lateral margin with 2 acclivities, spine formula = 3-3-3, setal formula = 0. Telson especially long, glandular, length-width, ratio = 4:3, almost fully cleft, each apex of medium width, rounded, lateral acclivity weak, bearing short lateral setule, then longer setule, spine next medial longer than adjacent setule, then another short setule medially, lateral margins each with brush of 4 setae, midlateral setules diverse, larger large. Urosomite 1 with lateral setule at base of uropod 1, ventral setal bundle scarcely riding upward, articulation line short, almost absent, urosomite 3 unprotuberant dorsally.

Male "h."—Rostrum narrower than in female. Article 2 of antenna 1 with 8 ventral setae, primary flagellum with 13 articles, 1 calceolus each on articles 2–6, aesthetascs weakly developed, no medial fuzz on article 1. Facial spine formula on article 4 of antenna 2 = 0-3-5-6, article 5 with 3 dorsal sets of male setae and 1 calceolus, ventrodistal apex with 2 thin spines and 1 setule, flagellar calceoli = 1, 2, 3, 5, 7 . . . n. Basofacial setal formula of article 3 on mandibular palp = 0-3. Coxa 4 smaller in relation to coxa 1 than in female. Pereopods 3–4 narrower than in female; article 2 of only pereopod 7 narrower than in female. Epimera 1–3 broadened, posterior margin of epimeron 3 not shortened, not protuberant, quadrate, setae extending downward (as in *floridana*) almost to ventral corner, setal formulas: epimeron 1 anteroventral = 8, then gap, or not, ventral = 8, posterior = 8, epimeron 2 facial = 13, posterior = 10, epimeron 3 posterior = 9, facial = 0, ventral = 3. Spine formulas of uropods, uropod 1 peduncle dorsolateral = 9, basofacial = 0, uropod 2 peduncle dorsal = 8–10, dorsal spines on outer ramus of uropod 1 = 5, of uropod 2 = 5, inner ramus of uropod 1 = 1–2, of uropod 2 = 7 (one inner ramus of uropod 2 with aberrant 2 apical nails). Ventral spines on peduncle of uropod 3 = 3, spine formula on article 1 of outer ramus = 3-3-3, setal formula = 0; apical setae on article 2 diverse but short. Shape of telson like female, distal spines scarcely shortened, variable formulas, 1 side with supernumerary second medial setule, each lobe with short row of dorsal denticles.

Juvenile "j."—Ventral setae on article 2 of antenna 1 = 5 tightly constrained, primary flagellum with 10 articles, accessory flagellum with 8 ar-icles. Spine formula on article 4 of antenna 2 = 1-3-5-4, on article 5 = 2, lagellum with 11 articles. Mandibles and inner plate of maxillipeds like adult. Epimeral setal formulas: epimeron 1 anteroventral = 3, then gap, posteroventral = 4, posterior = 5; epimeron 2 facial = 6 straight, posterior = 6; epimeron 3 ventral = 2, posterior = 7. Peduncle of uropod 1 with 3 widely spaced dorsolateral spines, medial = 4 spines plus displaced spine, outer ramus = 2, inner = 1; peduncle of uropod 2 with 4 dorsal spines, medially with 1 apical spine, no setules, outer ramus = 2, inner ramus = 1; peduncle of uropod 3 with 4 ventral setae, inner ramus reaching to M. 55 on article 1 of outer ramus, with 1 apical seta only, outer ramus with 3-3 lateral setae, article 2 on outer ramus 0.37 times as long as article 1. Telson like adult but no medial setule on apices, lateral brushes each with 2 setae.

Holotype.—AHF No. 5823, female "t" 6.57 mm.

Type-locality.—*Velero IV* Allan Hancock Foundation 5605-58, off Pt. Loma Light, California, 32°33′10″N, 117°13′15″W, 43 m, 18 February 1958.

Etymology.—Named for the Spanish explorer, Francisco Vásquez de Coronado, 1510–1554.

Material.—Male "h" 5.37 mm, *Velero IV* 4745; male "v" 6.55 mm and juvenile "j" 4.04 mm, *Velero* 5190; female identified, *Velero* 4908.

Relationship.—This species differs from *M. floridana* in the presence of 2 (not 1) main spines on the inner plate of the maxilliped, the presence of 9 (not 1) dorsolateral spines on the peduncle of uropod 1, the greater size of the armaments on the medial margin of the peduncle on uropod 2 (spines instead of setules), the presence of a marginal spine on the inner ramus of uropod 2 (none in *floridana*), the presence of only 2 (female) or 3 (male) ventral setae on epimeron 3 (generally 4+ in *floridana*) and in the subtleties of shape on the gnathopods (see illustrations here and in Barnard, 1960). *Metharpinia coronadoi* differs from *oripacifica* in all the above listed characters except that of the maxilliped.

Distribution.—Coastal shelf of southern California, 18–43 m.

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Literature Cited

Barnard, J. L. 1960. The Amphipod family Phoxocephalidae in the eastern Pacific Ocean with analyses of other species and notes for a revision of the family.—Hancock Pacific Expeditions 18(3):175–368, pls. 1–75, chart 1.

———. 1963. Relationship of benthic Amphipoda to invertebrate communities of inshore sublittoral sands of southern California.—Pacific Naturalist 3:437–467, figs. 1–7.

———. 1979. Revision of American *Paraphoxus* (Crustacea Amphipoda, Marine). Proceedings of the Biological Society of Washington 92:368–379.

———, and M. M. Drummond. 1976. Clarification of five genera of Phoxocephalidae (Marine Amphipoda).—Proceedings of the Biological Society of Washington 88:515–547, figs. 1–4.

———, and ———. 1978. Gammaridean Amphipoda of Australia. Part III: The Phoxocephalidae.—Smithsonian Contributions to Zoology 245: 1–551, figs. 1–269.

Schellenberg, A. 1931. Gammariden und Caprelliden des Magellangebietes, Südgeorgiens und der Westantarktis.—Further Zoological Results of Swedish Antarctic Expeditions 1901–1903, 2(6):1–290, figs. 1–136, pl. 1.

———. 1935. Amphipoden von Chile und Juan Fernández, gesammelt von Prof. W. Goetsch.—Zoologische Jährbucher, Systematik, 67:225–234, 3 figures.

Shoemaker, C. R. 1933. Amphipoda from Florida and the West Indies.—American Museum Novitates 598:1–24, figs. 1–13.

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